

# Detector R&D for an Electron Ion Collider

**14<sup>th</sup> Advisory Committee Meeting**  
**BNL, January 18-19, 2018**

*Thomas Ullrich (BNL)*  
January 18, 2018



# Electron-Collider Status

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- National Academy of Science Review
  - ▶ Last (known) committee meeting, Nov 27/28, 2017
  - ▶ Draft completed
  - ▶ Now with external reviewers
  - ▶ Release envisioned in April 2018
- EIC UG
  - ▶ EICUG Detector Discussion Meeting on Nov 30-Dec 1, 2017 at Temple University in Philadelphia
  - ▶ First EIC UG working groups (IR, Polarimetry) being created
  - ▶ Next User Meeting: July 30-August 3, 2018 at Catholic University of America, Washington, DC

# EICUG Detector Discussion Meeting (I)

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- Discussed:
  - ▶ Presentations on IR / Hall size / Machine parameters
  - ▶ Presentation on software consortium and current status
  - ▶ Vision for detector types and needs
    - ⦿ Overview of collider experiments both general purpose and specialized
    - ⦿ Current detector ideas
    - ⦿ Discussion session
- Agenda and presentations at  
<https://indico.bnl.gov/conferenceOtherViews.py?view=standard&confId=3737>

# EICUG Detector Discussion Meeting (II)

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- Results from Discussion
  - ▶ Overwhelming support for an EIC with 2 IRs
    - ◎ Both proposed facilities can accommodate 2 IRs
  - ▶ One detector needs to be a general-purpose detector
  - ▶ Type of second detector left open
    - ◎ Specialized detector
    - ◎ 2<sup>nd</sup> general-purpose detector
    - ◎ Needs to be complementary
      - Different strength
      - Keep in mind HERA: combination of H1 and ZEUS data reduced overall systematic uncertainties substantially
    - ◎ Should not come too long after 1<sup>st</sup> detector ( $\leq 3$  y)

# EICUG Detector Discussion Meeting (III)

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- Next Steps
  - ▶ Formation of two WG: IR & Polarimetry (imminent)
    - ◉ Close collaboration with efforts in labs
  - ▶ Ad-Hoc/One-Time Meetings/Workshops on relevant detector technologies and systems
    - ◉ 1-2 day workshops
    - ◉ Possible topics: calorimetry, tracking, PID, ...
    - ◉ Organized by interested EIC User Group members, implying especially members of this audience
    - ◉ Invite experts on referring topics
    - ◉ Look beyond current R&D efforts
    - ◉ Follow-up meetings optional if organizers feel it's useful
- Follow-up Meeting on Detector Discussion: next EIC UG meeting at CUA end of July

# FY2018 Funding Period

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- 11 Projects are funded in FY18
  - ▶ eRD1 - Calorimeter consortium
  - ▶ eRD3 - Fwd Tracking
  - ▶ eRD6 - Tracking consortium
  - ▶ eRD14 - PID consortium
  - ▶ eRD15 - Compton spectrometer
  - ▶ eRD16 - Fwd Silicon tracking
  - ▶ eRD17 - Simulations (BEAGLE)
  - ▶ eRD18 - Central Si tracking
  - ▶ eRD20 - Software consortium
  - ▶ eRD21 - Machine background studies
  - ▶ eRD22 - GEM TRD

**Green = consortia**

# EIC R&D Advisory Committee

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## Standing Advisory Committee:

Marcel Demarteau\* (Argonne)

Carl Haber (LBNL)

Peter Krizan (Ljubljana)

Ian Shipsey (Purdue)

Rick Van Berg (UPenn)

Jerry Va'vra (SLAC)

Glenn Young (JLab)

\*chair



Please use coffee breaks for informal discussion with committee members

Unfortunately 3 members could not make it this time  
(Peter, Ian, Marcel)

I am grateful to Carl Haber to take over the role of the chair for this meeting.

**08:00**    **Committee: Breakfast and Executive Session (Physics Department (bldg. 510) Room 2-160)**

**Physics Department (bldg. 510) Large Seminar Room**

	<b>Title</b>	<b>Speaker (Time)</b>	<b>Slides</b>
<b>08:50</b>	<b>Welcome and Overview</b>	<b>Thomas Ullrich (10)</b>	
<b>09:00</b>	<b>eRD3: Progress Report and Proposal: Forward tracking</b>	<b>Matt Posik (20+10)</b>	
<b>09:30</b>	<b>eRD6: Progress Report and Proposal: Tracking consortium</b>	<b>Kondo Gnanvo (30+5+10)</b>	
<b>10:15</b>	<b>Coffee Break</b>		
<b>10:35</b>	<b>eRD16: Progress Report and Proposal: Fw. Si Tracking</b>	<b>Ernst Sichtermann (20+10)</b>	
<b>11:05</b>	<b>eRD18: Progress Report and Proposal: Central Si Tracking</b>	<b>Peter Jones (20+10)</b>	
<b>11:35</b>	<b>LoI: MAPS Sensor and Readout Electronics R&amp;D for EIC Detector</b>	<b>Shaorui Li (15+5)</b>	
<b>11:55</b>	<b>Lunch Break</b>		
<b>13:30</b>	<b>eRD14: Progress Report and Proposal: PID Consortium</b>	<b>Pawel Nadel-Turonski (30+10)</b>	
<b>14:10</b>	<b>eRD1: EIC Calorimeter Development</b>	<b>O. Tsai and T. Horn (30+10)</b>	
<b>14:50</b>	<b>eRD22: GEM based Transition Radiation Tracker R&amp;D for EIC</b>	<b>Yulia Furletova (20+10)</b>	
<b>15:20</b>	<b>Coffee Break</b>		
<b>15:40</b>	<b>eRD17: BeAGLE, a Tool to Refine Detector ...</b>	<b>Mark Baker (20+10)</b>	
<b>16:10</b>	<b>eRD21: EIC Background Studies ...</b>	<b>Latifa Elouadrhiri (20+10)</b>	
<b>16:40</b>	<b>eRD20: Developing Simulation and Analysis Tools</b>	<b>Alexander Kiselev (20+10)</b>	
<b>17:10</b>	<b>Executive Session (Physics Department (bldg. 510) Room 2-160)</b>		



**Friday, January 19, 2018**

**08:00    Committee: Breakfast and Executive Session (Physics Department (bldg. 510) Room 2-160)**

**Physics Department (bldg. 510) Large Seminar Room**

	<b>Title</b>	<b>Speaker</b>	<b>Slides</b>
<b>9:00</b>	<b>eRD15: Compton Electron Detector R&amp;D</b>	<b>Joshua Hoskins (20+10)</b>	
<b>9:30</b>	<b>BNL Instrumentation Division</b>	<b>David Asner (25+5)</b>	
<b>10:00</b>	<b>Coffee Break</b>		
<b>10:20</b>	<b>Homework Talks</b>		
<b>11:20</b>	<b>Committee Executive Session &amp; Working Lunch (Physics Department (bldg. 510) Room 2-160)</b>		
<b>13:30</b>	<b>Close-Out (Physics Department (bldg. 510) Room 2-160)</b>		

# Many Thanks ...

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- **Liz Mogavero** for dealing with the contracts
- **Rachel Nieves** for organizing the meeting
- The **EIC R&D Committee** for their enthusiasm and hard work to make the program work
- To **all participants** for the interest and engagement in the projects and their patience

Looking forward to a successful meeting